

**WHAT IS CLAIMED IS:**

1. A method of controlling the relationship between a primary surface and a reference surface in a probe card analysis system; said method comprising:
  - defining said reference surface at a selected point on a metrology frame;
  - 5        attaching a plurality of linear actuators to said metrology frame;
  - coupling a platform supporting said primary surface to each of said plurality of linear actuators; and
  - controlling the relationship between said primary surface and said reference surface utilizing said plurality of linear actuators.
- 10    2. The method of claim 1 wherein said coupling comprises utilizing a flexural assembly between said platform and each of said plurality of linear actuators.
3. The method of claim 1 wherein said controlling comprises driving each of said plurality of linear actuators in unison.
4. The method of claim 1 wherein said controlling comprises driving one of said plurality of  
15        linear actuators independently.
5. The method of claim 4 wherein said controlling comprises dynamically controlling an angular orientation between said primary surface and said reference surface.
6. The method of claim 4 wherein said controlling comprises dynamically compensating for changes in shape of structural elements of said probe card analysis system.
- 20    7. The method of claim 1 wherein said controlling comprises determining a distance between said primary surface and said reference surface at one or more selected locations on said platform.
8. The method of claim 7 wherein said determining comprises utilizing a linear encoder at said one or more selected locations.
- 25    9. The method of claim 8 wherein said controlling further comprises feeding distance information back to said plurality of linear actuators responsive to said determining.
10. A metrology system comprising:
  - a metrology frame having one or more vertical structural members;
  - a plurality of linear actuators attached to said frame; and
  - 30        a platform supporting a primary surface; said platform coupled to each of said plurality of linear actuators.
11. The metrology system of claim 10 further comprising:

a respective flexural assembly attached to each of said plurality of linear actuators and coupling a respective linear actuator to said platform.

12. The metrology system of claim 11 wherein each said respective flexural assembly is operative to minimize lateral cross-coupling between said plurality of linear actuators.

5 13. The metrology system of claim 10 further comprising a respective linear encoder associated with each of said plurality of linear actuators.

14. The metrology system of claim 13 wherein each respective linear encoder is operative to acquire distance information representing a distance between said primary surface and a reference surface at a selected location on said platform.

10 15. The metrology system of claim 14 wherein each of said plurality of linear actuators is driven in unison responsive to said distance information.

16. The metrology system of claim 14 wherein one of said plurality of linear actuators is driven independently responsive to said distance information.

15 17. The metrology system of claim 10 wherein each of said plurality of linear actuators is attached to a respective one of said one or more vertical structural members.